Space Weather Forecast

Issued on Tuesday 14 January 2025 at 12:31 Local

This forecast provides a four-day assessment of space weather events. The probabilities stated below are for reaching or exceeding the given levels. For more information about space weather impacts please see the Met Office Space Weather Scales https://www.metoffice.gov.uk/weather/learn-about/space-weather/uk-scales

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Space Weather Forecast Headline: Slight Chance of isolated Moderate flares, slowly increasing. Faster solar wind enhancement likely.

Analysis of Space Weather Activity over past 24 hours

Solar Activity: Solar activity has been Low during the last 24 hours with only Common-class flares recorded.

There are seven sunspot regions on the visible disc. A region on the northwest limb remains the most magnetically complex group, but analysis is now difficult as it rotates over the western limb. A region on the northeast limb continues to move into better view, with small spots becoming visible surrounding the large forward spot. A new region is also emerging from around the southeast limb. Other regions remain smaller and simple with limited overall change.

No Earth-bound CME's (coronal mass ejections) were observed during this period.

Solar Wind / Geomagnetic Activity: Solar winds were slightly elevated, ranging from 400-500 km/s, with the likely onset of a faster wind stream. The Interplanetary Magnetic Field, Bt, was at weak levels. The north-south component, Bz, varied weakly. Geomagnetic activity was Quiet (Kp1-2).

Energetic Particles / Solar Radiation: The count rate of energetic particles (high energy protons) was at background levels.

Four-Day Space Weather Forecast Summary

Solar Activity: Generally Low, with a slowly increasing chance of isolated Moderate flares and a very slight chance of isolated Strong flares, mainly due to a moderately large sunspot region located in the northwest disc or any spots that rotate over the eastern limb later in the period.

Solar Wind / Geomagnetic Activity: Solar winds have been slowly rising, with observed speeds now around 420-450 km/s. The source is likely a coronal hole in the west of the disc. Speeds most likely remaining at slightly elevated to elevated levels through Day 1 (14 Jan), before easing Days 2 (15 Jan). A connection to another coronal hole approaching central disc in the southern hemisphere is then possible from late on Day 3 (16 Jan) or early on Day 4 (17 Jan)., with solar winds likely increasing once again. No CMEs (coronal mass ejections) currently feature in the forecast.

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Geomagnetic activity is expected to be mainly Quiet to Unsettled (Kp1-3) throughout, but with a chance of Active (Kp4) intervals in association with coronal hole HSS enhancements. There is a slight chance of isolated G1 Minor Geomagnetic Storms (Kp5) Days 3-4 (16-17 Jan) in association with faster solar winds.

Energetic Particles / Solar Radiation: Solar radiation is expected to remain at background levels, with only a slight chance of rising in response to any notable flares.

Geomagnetic Storms

Geomagnetic Storm Probability (Exceedance)	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Minor or Moderate	G1 to G2	No	5	1	15	20
Strong	G3	No	1	1	1	1
Severe	G4	No	1	1	1	1
Extreme	G5	No	1	1	1	1

Radio Blackouts - X-Ray Flares

X-Ray Flares Probability	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	R1-R2 (M Class)	No	25	30	35	40
Very Active	R3-R5 (X Class)	No	5	5	10	10

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Solar Radiation Storms (High Energy Protons)

Radiation Storms Probability (Exceedance)	Level ($cm^{-2}sr^{-1}s^{-1}$)	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	**≥ S1**	No	10	10	10	10
Very Active	**≥ S3 ***	No	1	1	1	1
* S3 ≥ 10 MeV ≥ 1000 pfu and/or 50 MeV ≥ 10pfu. (pfu = $cm^{-2}sr^{-1}s^{-1}$)						

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